Coleman (J. S.)

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THE MULTIPLE WEDGE PRINCIPLE IN THE TREATMENT OF ORGANIC STRICTURES OF THE URETHRA.

It is now nine years since I published, in the *Medical Record*, of New York, my application of the multiple wedge principle to the treatment of organic strictures of the urethra.

To quote from that paper: "It ought to be a self-evident proposition, that it is easier to introduce singly the component parts of a wedge, than to introduce it as a whole. Take, for example, a No. 12 conical bougie, even capillary at its point, and attempt to introduce it into a stricture. Where is the point of friction and resistance? Is it not around the entire circumference of the stricture? Diminish the size of the instrument, and, in a direct ratio, you diminish the amount of resistance. After having passed into a stricture one of these whalebone guides, the second has to overcome the friction and resistance of but half the circumference of the stricture, and the line of contact with the other bougie. Now that we have passed these two, we have a groove in front and behind them, through which we can readily pass the third and fourth, having now to overcome the resistance of but one-fourth the circumference of the stricture and the two lines of contact with the instruments already in position."

Since that time I have treated by this method some twenty-five or thirty cases with invariable success. There was not, in any case, marked febrile disturbance. But in some few cases there was sufficient constitutional irritation to cause me to suspend the treatment for a day or two.

It is my habit to give, as a prophylactic, full doses of quinine, say fifteen to twenty grains per day.

I will give in detail one case, as it fully illustrates my method.

Capt. H. D. F. presented himself for treatment of a stricture of twenty years' duration.

His urine was always voided with difficulty, and the act usually consumed from twenty to thirty minutes of his time.

There was marked cystitis, as evidenced by the abundant mucus and the decomposition of his urine. The fetor of his urine was so great as to necessitate the immediate removal of the "pot de chambre." His strictures had been ruptured twice during the year 1866, and once in 1867, with Holt's divulsor.

Since the last operation he had wholly neglected himself.

March 16, 1879. After a prolonged and tedious effort, I succeeded in *worming* through his stricture one of the smallest sized French filiform bougies, and securely tied it *in situ*. Five days afterwards I succeeded in introducing a second by the side of the first, but the cicatricial tissue was so dense and unyielding that it was not until the fifteenth day that I could pass the third.

On the twenty-fifth day I readily passed a fourth and fifth bougie.

On the twenty-eighth day I readily passed the sixth. At no time was there any hindrance to the passage of the urine. Feeling assured that now the calibre of the urethra would admit a good sized instrument, I attempted to remove the bundle of filiforms. In this I was disappointed; for a sufficient amount of concretion had formed to prevent their removal *en masse*. The string binding them together was cut, when they were readily removed, until the last (the first one introduced), which required some little force to withdraw it. Three inches of its distal end had been covered by a *phosphatic* concretion. About one-half the deposit had slipped off the bougie in its withdrawal. (In subsequent cases I have obviated this *contretemp* by removing, from time to time, those first introduced, and replacing them by new instruments.)

My patient was now so nervous that he would not permit me to use a sound.

On the twenty-ninth day, retention of urine having occurred, the patient was chloroformed, and a No. 9 steel sound (Am. scale) readily passed until it reached the prostatic urethra, where it was

arrested by the calculous mass. With a little force it easily entered the bladder. To prevent the possibility of another stoppage, to still further cause the *absorption* of the cicatricial material, and, for the purpose of irrigation, I now introduced and tied in a No. 16 Nélaton catheter. Twice daily, a solution of salicylic acid and quinine was injected into the bladder, thoroughly washing it out.

On the thirty-eighth day, No. 16 was removed and No. 18 introduced and kept in place four days.

Steel sounds were now passed, from time to time, until the urethra was dilated up to No. 30 of the French scale. The concretions left in the bladder were all extruded within a week. (These specimens, together with the bougie, are here presented.)

The patient was instructed to pass, from time to time, a large sized sound.

It is now five years since Capt. F. was under treatment, and there has not been, so far as I know, a single symptom of a return of his disease. I know that many of my associates will object to the multiple wedge because of its tediousness.

I claim for it safety, certainty, and a greater immunity from a return of the disease, than by any other treatment known to me. Also that it will obviate the necessity for divulsion, internal or external urethrotomy. My reasons for not accepting any of the above operations are, first, that they subject the patient to an unnecessary risk of life; second, that in internal urethrotomy from behind forwards, it is necessary to dilate the stricture to the calibre of a No. 7 or 9 English scale, before the instrument can be used; third, that internal urethrotomy from without inwards is, under favorable circumstances, uncertain. Even with Mr. Teevan's tunnelled urethrotome (which I consider least objectionable) mishaps are liable to occur, *vide* his article in the American reprint of the *London Lancet* for 1874, page 210, wherein he states that one of Dr. Gouley's whalebone guides "was cut in two about its centre, six inches of the whalebone being left behind in the stricture. As the patient experienced no pain from its presence, I determined to leave it in the urethra, in the hope that it would set up a profuse discharge, and so facilitate the treatment. In this expectation I was, how-

ever, disappointed, and on December 1st, I removed the broken portion of the bougie after its seven days' imprisonment."

One of the gravest and most obstinate of my cases, was that of a gentleman who, under the care of another practitioner (one whom Sir Henry Thompson characterizes as a "knowing man at anatomy"), had been subjected to a forced entrance into the bladder. Pyæmia followed as a result of this violence with the formation of five abscesses.

One at the posterior border of the right scapula, and from which was evacuated at least one gill of pus; one beneath the left tensor vaginæ femoris; one beneath the right vastus internus, and which I believe reached the popliteal space, and one upon each internal maleolus.

The life of this patient trembled in the balance for weeks, but he finally made a thorough and complete recovery. His stricture was subsequently relieved by the multiple wedge. My friend, Dr. H. F. Campbell, who saw this case in consultation with me, said that it was the only case of pyæmia which he had ever known to recover. I concur in the axiom first enunciated by Professor Syme, that "whenever urine passes outwards through a stricture, an instrument ought with care and perseverance be got in."

Also, in the dictum of Sir Henry Thompson, "first and foremost, *dilatation, dilatation always, dilatation without exception whenever* it will succeed." (Italics mine.) In corroboration of my position I beg leave to make the following quotations.

Dr. Frank H. Hamilton, in his *Principles and Practice of Surgery*, says of organic stricture: "To the question so often repeated by inexperienced surgeons, What proportion of organic strictures can be successfully treated by gradual dilatation? we answer unhesitatingly, almost every stricture into which the smallest sound or bougie can be introduced. And, to the question which naturally follows, Are there any strictures through which urine can pass which cannot be entered by instruments? we reply that we have seldom or never met with them; and that such examples must at least be exceedingly rare. It is not pretended that all strictures of this class can be entered at

once; but only with patience, perseverance, and skill, within a few weeks or months at most, they will in all probability yield to the instruments, and the bladder will be safely entered.

"It is an error to suppose that a stricture treated by caustic or incision is cured any more thoroughly than when it has been treated by dilatation, or, as it might be more properly called, by absorption. There is no soundness in the theory upon which the claim is attempted to be sustained; and there is no experience to justify the assumption. We have observed the results of all these forcible methods in many cases; and there is the same tendency in all of them to a return of the stricture, unless the dilatation is afterwards maintained by the occasional and regular introduction of instruments. The only objection that can be offered to gradual dilatation, then, is the length of time it may require to complete the cure, as contrasted with forcible dilatation, caustic, incision, and perineal section; but, on the other hand, it cannot be denied that, in point of safety, gradual dilatation has greatly the advantage. Death is seldom or never the result of the latter procedure; but, from all we have seen and heard of the other methods, they are followed by a mortality equal to five or seven per cent. Nor does it seem to vary much whether caustic, internal incision, forcible dilatation, or perineal section were employed. Indeed, some gentlemen of large experience, who favor frequent incisions, admit a mortality of not less than seven per cent., and regard it as a flattering testimony to the excellency of their practice, because in very many surgical operations which are deemed justifiable, the mortality is twenty-five or fifty per cent. The fallacy of the argument is too apparent to require exposure. If one is convinced, however, that the condition of the patient demands speedy relief, or if it should happen that the stricture will not yield to gradual dilatation, the surgeon may resort to some one of the other methods already named, and which we shall now proceed to describe."

Dr. Otis, in his paper on Stricture of the Male Urethra; Its Radical Cure, published in 1875, closes with the following paragraph: "Strictures of a calibre of less than 16 or 18 of the

French scale (7 or 9 of the English), and hence *below the capacity of the dilating urethrotome* as at present constructed, require enlargement by gradual dilatation with soft bougies, when this is well borne; if not by divulsion or the urethrotome of M. Maisonneuve.

"After having been brought by any one of these methods, above referred to, *up to a capacity permitting the passage of the dilating urethrotome*, complete divulsion of the stricture by means of this instrument may readily be effected." (Italics mine.)

In Dr. Sands's reply to Dr. Otis, on spasmodic stricture of the urethra, he says: "I have seen, in consultation, persons who have suffered from troublesome hemorrhage, varying in duration from a few days to a month, in consequence of having been cut with the dilating urethrotome—an excellent instrument of its kind, but the use of which has been carried to a dangerous excess. Finally I have heard of a number of cases in which death has resulted from the employment of the dilating urethrotome. It is hard to obtain access to these fatal cases, which are not usually reported, and which are generally considered a kind of private property. I can state with authority, however, that three fatal cases of operation with the dilating urethrotome have lately happened in our city hospitals; two of which occurred last week in one hospital.

"In two of the cases mentioned, death took place from pyæmia within a week of the operation. In the third case, death occurred from uræmia on the sixteenth day after the operation, which was performed for the division of an anterior stricture so slight as to be detectable only with a bulbous sound No. 24 French. At the autopsy, three deep incisions were found, involving the anterior three and a half inches of the floor of the urethra, the mucous membrane of which, in this situation, was not thickened, and showed no appearance of disease to the eye.

"A tight organic stricture, undivided, was noticeable at the bulbo-membranous junction. This during life had been treated by dilatation."

In the American reprint of the *London Lancet* for 1874, page

404, Mr. Teevan in his "description of a catheter urethrotome with conducting bougie," says: "Then again, most of the urethrotomes are so large at their vesical extremity that they cannot be used, unless the urethra has been previously dilated up to a certain calibre. This remark especially applies to those urethrotomes that divide from behind forwards. For a urethrotome to be a safe and efficient instrument for the division of tight strictures in the deeper portions of the urethra, it must possess two important qualities.

"First, its vesical extremity must be so fine that it can be introduced through very tight strictures. It consequently follows, that the urethrotome must be one which divides from before backwards, for, *if the stricture be capacious enough to permit an instrument to pass, which cuts from behind forwards, the indication for any operation is doubtful; again, if we have dilated the urethra up to half its natural calibre, why should we not persevere with the treatment which has been so successful, and that too, in the worst and most troublesome stage of the complaint?* (Italics mine.) What we want is to save time in certain cases where patients have, for instance, to go to sea suddenly, and where time does not permit of a course of treatment by gradual dilatation."

In the abstract of Guy's Hospital Reports in the *American Journal of the Medical Sciences* for January 1879, page 178, the following views are quoted from Mr. Cooper Forster: "He has done external urethrotomy only once in the last seven years, and then regretted it afterwards, and he has never performed internal urethrotomy.

"He relies on the hot bath, opium, and *gradual dilatation.*" (Italics mine.)

M. Despres, in a communication to the Societé de Chirurgie, October 16th, 1878, on the extraction of prostatic calculus, "did not wish to perform urethrotomy, as he considers this an operation which *renders the stricture more fibrous and resisting.*" (Italics mine.)

In the American reprint of the *London Lancet* for February, 1879, page 71, I find the following emphatic language from Mr. S. Messenger Bradley upon the subject of internal urethrotomy:—

"In boldly criticising it, then, as dangerous and unsatisfactory, I would have you remember that it is criticism of one who has never performed it, and who, I think I may add, never will."

Sir Henry Thompson, in his *Clinical Lectures on Diseases of the Urinary Organs*, and than whom, upon this subject, there is no higher authority, fully sustains me in the position I have assumed. *Vide* page 32 of the above-mentioned monograph.

"I will touch but lightly on the continuous dilatation, or the tying in of the instrument. There is a patient up stairs who is now undergoing it successfully. You have tried, we will suppose, the simple dilatation and have not made the amount of progress desired; or, perhaps, the patient's avocations may make it necessary to have a more speedy cure. In either case you may say, if you can give me ten or fourteen days in your room, not necessarily in bed, but on the sofa quietly at home, I can almost certainly bring you from the smallest number up to the highest; that is by continuous dilatation." As to the length of time required, Sir Henry claims greater potency for the continuous method than I have, as yet, been able to attain. "In simple dilatation the instrument is simply introduced and withdrawn; in continuous you tie the instrument in, and allow it to remain for several days. You tie in a small catheter, which if possible, is to be gum-elastic, and so that it just enters the bladder. And you should always take care that it is small enough to pass easily, so that it lies loosely in the canal. Those three conditions being granted *this is one of the safest and best modes of treating stricture.*" (Italics mine.)

In response to a note of inquiry, my friend, Dr. Eugene Foster, member of the American Public Health Association, and Ex-Vice-President of the Georgia State Medical Association, kindly furnishes me with the following communication.

AUGUSTA, GA., Nov. 23, 1883.

DEAR DOCTOR: In reply to your letter of the 22d, asking my experience in treating strictures of the urethra by your multiple wedge principle, I beg to submit the following answer: I have treated sixteen cases of close organic stricture by your method (several of them of years' standing) and every one of them success-

fully. Your plan of treatment has in my hands proven itself all that you claim for it. I am amazed that surgeons generally have not tested its merits, and long since given you credit for your valuable suggestions.

Signed, Very truly yours,

To Dr. Jno. S. Coleman. EUGENE FOSTER.

Conclusions.—In the foregoing paper the following are the principal precepts that have been advocated:—

First: That in the treatment of organic strictures of the urethra, urethrotomy, whether internal or external, and also the method by divulsion, are attended with serious risk to the patient on account of hemorrhage, pyæmia, and uræmia.

Second: That strictures treated by these methods are no less liable to recurrence than those treated by gradual dilatation. Indeed, unless followed by persistent dilatation they are subject to early relapse.

Third: That gradual dilatation of urethral strictures, though of slower progress in the beginning, is almost entirely free from danger, more permanent in its results, and upon the whole the shortest and most perfect method of cure.

Fourth: That in the treatment of tight urethral strictures the *multiple wedge principle* devised by the writer, viz., that of introducing side by side and one at a time successively a number of filiform bougies, whether applied to the interrupted, or the continuous method, offers to the surgeon the easiest, safest, and best method for effecting the solution, or *absorption* of the inodular tissue, and for removing the obstruction.

Note.—In the discussion of the above paper, as reported by the *Medical Record* of New York, "Dr. Sayre thought it somewhat strange that the author of this paper claimed to be the originator of the multiple wedge system, since to his personal knowledge it had been in use in Bellevue Hospital, New York, for at least twenty years."

To me, it is passing strange that my friend, Prof. J. W. S. Gouley, a member of the staff of Bellevue, and the author of one of the best monographs on "Diseases of the Urinary

Organs," should not have appreciated a system, which, according to Dr. Sayre, had then been in use in the Hospital for eleven years. That he did not do so is manifest from the following language in his letter to me of date Dec. 9th, 1874. "I have myself wedged in two and sometimes three of these bougies side by side, and have thus rendered otherwise impassable strictures amenable to ordinary dilatation. Three years ago I had some probe-pointed whalebone bougies made very small (capillary), for the first two inches from the vesical end and thence increasing gradually to Nos. ½, 1, 2, 3, and 4, *so that I could accomplish more dilatation with a single bougie at one sitting than I could with two or three ordinary whalebone capillary bougies introduced side by side.*" (Italics mine.)

I claim to have made the multiple wedge principle *a system* for the treatment of tight, close, and otherwise impassable strictures, to have given it a name, and to have been the first to make it known to the profession.

Whewell says "names record discoveries."